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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/771,544	02/05/2004	Maki Hoshino	040302-0379	2816

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WASHINGTON, DC 20007

EXAMINER

STADLER, REBECCA M

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 08/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/771,544	Applicant(s) HOSHINO, MAKI	
	Examiner Rebecca M. Stadler	Art Unit 1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 05 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a.) Claim 8 is unclear as to what "monolithic" means. For purposes of this action, all solids are deemed included by the term.

b.) The phrase "liter ... catalyst" is unclear as to how the volume of the solid is calculated. For example, how would one calculate the volume for a solid with many holes in it?

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-2 and 9 are rejected under 35 U.S.C. 102(a) as being anticipated by Takamura 6,548,034.

As to claim 1, Takamura '034 teaches a method of reducing the carbon monoxide concentration of a mixed gas containing hydrogen, carbon monoxide and oxygen (see column 4, lines 4-13). The method provides a carbon monoxide concentration reducing catalyst, which has a transition metal element (see column 4, lines 7-9) and the mixed gas supplied to the catalyst is at a gas hourly space velocity of 100 – 100,000 [1/h] (see column 4, lines 59-62) with a reaction temperature in the range of 40°C to 200°C. As the Takamura '034 catalyst is capable

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of space velocities and reaction temperatures within the claimed ranges, it is inherent that the Takumara '034 catalyst also possesses the claimed carbon monoxide adsorption amount adjusted from 0.1 to 3mL/cat.g. As such, the Takamura '034 process anticipates every limitation of claim 1.

As to claim 2, the Takamura '034 process provides a feed stream whereby the carbon monoxide concentration is about 1 mol% (see column 5, lines 33-36), which falls into the claimed range of 0.1 to 2 vol%. The oxygen concentration in the mixed gas is 0.5 to 4 times the carbon monoxide concentration (see column 4, lines 55-57), which also falls into the claimed range of 0.5 to 1.5 molar times the carbon monoxide concentration.

As to claim 9, the mixed gas supply in the Takamura '034 process is reformed gas obtained by reforming a fuel containing a hydrocarbon (see column 3, lines 41-44).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

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evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 3-5, 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takamura '034.

The rejection of claim 1 above is incorporated herein.

As to claim 3, Takamura '034 discloses that the carbon monoxide reducing catalyst contains cobalt, nickel, copper or manganese (see column 5, lines 6-9). Although the process does not disclose iron, the examiner takes Official Notice that iron is old and well known in the art for use as a carbon monoxide oxidation catalyst. Selecting the ratio of claim 3 (see column 4, lines 45-49) is an obvious matter of optimization. See, e.g., In re Bosch, 205 U.S.P.Q. 215 (CCPA 1980).

As to claims 4 and 5, the second component of the catalyst in the Takamura '034 process is a noble metal, which is platinum (see column 5, lines 13-14). As to the claimed ruthenium, comparative example 3 in column 8 teaches that ruthenium can be used as a carbon monoxide oxidation catalyst. Further, the examiner takes Official Notice that both ruthenium and rhodium are old and well known in the art for being effective carbon monoxide oxidation catalysts. As such, the platinum of Takamura '034 is taken as representative of the claimed ruthenium and rhodium.

As to claim 8, in Takamura '034, the carbon monoxide reducing catalyst is a monolithic catalyst (see example 2 in column 8, and column 4, lines 4-37 showing a supported catalyst). The amount of the second component appears to fall within the range of 2g or less per liter of the monolithic catalyst (see column 4, lines 45-49, as compared to example 1 in the present invention disclosure).

As to claim 10, the examiner takes Official Notice that the exhaust stream of an internal combustion engine contains carbon monoxide. With that knowledge, Takamura '034 teaches

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that the gas can be supplied by a process for reforming hydrogen methanol, et cetera (see column 1, lines 11-15); therefore, Takamura '034 suggests that it does not matter where the carbon monoxide containing gas stream comes from. As such, it would have been obvious to one of ordinary skill in the art at the time of this invention to use the carbon monoxide containing gas stream from an internal combustion engine in order to supply the gas for carbon monoxide reduction.

Claims 1, 3, and 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takamura '034 in view of Shore 6,913,739.

The rejections of claims 1 and 3 above are incorporated herein.

As to claims 6 and 7, Takamura '034 does not teach that the second component is a rare earth metal. Shore '739 does teach the use of a rare earth metal as a component of the catalyst (see column 3, lines 57-61). Shore '739 further discloses that the rare earth metal can be lanthanum, cerium, neodymium, and praseodymium (see column 5, line 64 – column 6, line 5). As cerium (and other rare earth metals) are known to be effective, yet less expensive preferential oxidation catalysts (see column 3, lines 11-16), it would have been obvious to one of ordinary skill in the art to combine the rare earth metal catalyst component of Shore '739 with the catalyst composition of Takamura '034 in order to reduce the carbon monoxide composition in a gas stream effectively with reduced cost. It is further noted that when A is known (transition metal) and B (rare earth metal) is known to perform a function (carbon monoxide oxidation), then A and B together is obvious. See, e.g., In re Kerkhoven, 205 U.S.P.Q. 1069 (CCPA 1980).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rebecca M. Stadler whose telephone number is 571-272-1700. The examiner can normally be reached on Normal.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

rsm



STUART L. HENDRICKSON
PRIMARY EXAMINER